

LIST OF CONTENTS

Number 1

P. Lamba and J. L. Hudson	1	Experiments on bifurcations to chaos in a forced chemical reactor
R. E. Morris and F. Shadman	9	Control of sulphur oxides emission during the roasting of lime-coated metal sulphide pellets
L.-S. Fan, T. Yamashita and R.-H. Jean	17	Solids mixing and segregation in a gas-liquid-solid fluidized bed
S. Mukkavilli, L. L. Tavlarides and C. V. Wittmann	27	Integral method of analysis for chemical reaction in a nonisothermal finite cylindrical catalyst pellet—I. Dirichlet problem
S. Mukkavilli, L. L. Tavlarides and C. V. Wittmann	35	Integral method of analysis for chemical reaction in a nonisothermal finite cylindrical catalyst pellet—II. Robin problem
M. Sheintuch and D. Luss	41	Identification of observed dynamic bifurcations and development of qualitative models
C. S. Lee, J. J. Ou and S. H. Chen	53	The velocity profile and resultant mixing with chemical reaction in rotating tubular flow
N. Shah and J. M. Ottino	63	Transport and reaction in evolving, disordered composites—I. Gasification of porous solids
N. Shah and J. M. Ottino	73	Transport and reaction in evolving, disordered composites—II. Coke deposition in a catalytic pellet
C. C. Chan and C. J. Lee	83	A mass transfer model for the extraction of weak acids/bases in emulsion liquid-membrane systems
R. F. S. Freitas and E. L. Cussler	97	Temperature sensitive gels as extraction solvents
Y.-L. Hwang	105	Dynamics of continuous countercurrent mass-transfer processes—I. Single-component linear systems
O. Iordache and S. Corbu	125	A stochastic model of lumping
M. Abbas and V. P. Tyagi	133	Analysis of a hollow-fibre artificial kidney performing simultaneous dialysis and ultrafiltration
G. Nagel, G. Kluge and W. Flock	143	Modelling of non-isothermal multicomponent adsorption in adiabatic fixed beds—I. The numerical solution of the parallel diffusion model
G. Kluge, W. Flock and G. Nagel	155	Modelling of non-isothermal multicomponent adsorption in adiabatic fixed beds—II. On the relative velocities of concentration and temperature fronts
<i>Shorter Communications</i>		
Z. Spekuljak	163	A criterion to determine the occurrence of the "Marangoni effect" in a thin liquid film
G. Vatai and M. N. Tekić	166	Gas hold-up in bubble columns with non-Newtonian liquids

I. Eroğlu and T. Doğu	169	Significance of boundary conditions in a two-phase flow system with mass transfer
A. L. Athayde and R. Govind	172	The effect of fouling on the stability of membrane bioreactors
H. W. Haynes Jr. and M. M. Stephens	175	A note concerning the energy balance in a heterogeneous catalyst particle
W. Rutzler	177	Dynainic simulation of plug flow packed bed reactors
K. S. Pedersen and A. Fredenslund	182	An improved corresponding states model for the prediction of oil and gas viscosities and thermal conductivities
W. R. Paterson	186	On some separation heuristics
T. Westerlund and H. Saxén	188	On the uniqueness in equilibrium calculations
		<i>Letters to the Editors</i>
R. Clift, J. P. K. Seville, S. C. Moore and C. Chavarie	191	Comments on buoyancy in fluidized beds
L. G. Gibilaro, R. Di Felice, S. P. Waldram and P. U. Foscolo	194	Authors' reply to comments by Clift <i>et al.</i>
		<i>Announcement</i>
	197	The 9th International Congress on Catalysis

Number 2

J. H. Meldon	199	Review Article Number 22. Blood-gas equilibria, kinetics and transport
P. K. Das, R. Kumar and D. Ramkrishna	213	Coalescence of drops in stirred dispersion. A white noise model for coalescence
H. Kehlen and M. T. Rätzsch	221	Complex multicomponent distillation calculations by continuous thermodynamics
M. Sheintuch and D. Luss	233	Identification of observed dynamic centres for analysis of experimental data
J. H. Masliyah, G. Neale, K. Malysa and T. G. M. van de Ven	245	Creeping flow over a composite sphere: solid core with porous shell
Md. M. Hossain and D. D. Do	255	Immobilization of multi-enzyme in porous solid supports—a theoretical study
N. Brauner	265	Roll wave celerity and average film thickness in turbulent wavy film flow
R. H. Davis and D. T. Leighton	275	Shear-induced transport of a particle layer along a porous wall
J. Jareš and J. Procházka	283	Break-up of droplets in Karr reciprocating plate extraction column
S.-Y. Chen, J. M. Smith and B. J. McCoy	293	Effect of hydrogenation catalyst activity on adsorption and surface reaction rates
S. K. Scott	307	Isolas, mushrooms and oscillations in isothermal, auto-catalytic reaction-diffusion equations

W. Bujalski, A. W. Nienow, S. Chatwin and M. Cooke	317	The dependency on scale of power numbers of Rushton disc turbines
Z. Kubičková, M. Kubiček and M. Marek	327	Fed-batch operation of stirred reactors
T. Kai and S. Furusaki	335	Methanation of carbon dioxide and fluidization quality in a fluid bed reactor—the influence of a decrease in gas volume
I. R. Sweet, S. S. Gustafson and D. Ramkrishna	341	Population balance modelling of bubbling fluidized bed reactors—I. Well-stirred dense phase
P. T. L. Koh, J. R. G. Andrews and P. H. T. Uhlherr	353	Modelling shear-flocculation by population balances
D. J. Gunn	363	Axial and radial dispersion in fixed beds
V. Hudcova, A. W. Nienow, W. Haozhung and L. Huoxing	375	<i>Shorter Communications</i> On the effect of liquid height on the flooding/loading transition
N. N. Clark and A. G. Jones	378	On the prediction of liquid circulation in a draft-tube bubble column
J. G. Yates	379	On the erosion of metal tubes in fluidized beds
S. J. Trank and E. L. Cussler	381	Flat sheets of temperature sensitive gels
V. R. Choudhary and K. R. Srinivasan	382	Sorption of benzene in H-ZSM-5 at catalytic conditions using gas chromatographic sorption/desorption technique
P. N. Rowe	387	<i>Letters to the Editors</i> Comments on the effect of pressure on the minimum bubbling velocity of polydisperse materials
M. Ściążko and J. Bandrowski	388	Author's reply to comments by P. N. Rowe
V. Linek, V. Vacek, P. Beneš and J. Sinkule	389	Comments on initial response analysis of mass transfer in gas sparged stirred vessels
L. G. Gibilaro and S. N. Davies	391	Authors' reply to comments by V. Linek <i>et al.</i>
J. L. Guíñón	392	Comments on calculation of pH value of a mixture of solutions
T. Westerlund	393	Author's reply to comments by J. L. Guíñón
	395	Errata

Number 3

A. Lodes and O. Mierka	397	Local phenomenological properties of turbulence in the suspension flow of solid particles—gas system
T. A. Duever, S. E. Keeler, P. M. Reilly, J. H. Vera and P. A. Williams	403	An application of the Error-in-Variables Model—parameter estimation from Van Ness-type vapour-liquid equilibrium experiments
G. Astarita	413	The asymptotic status of the Sherwood-Pigford model in the theory of absorption with chemical reaction

W.-C. Yu and G. Astarita	419	Selective absorption of hydrogen sulphide in tertiary amine solutions
W.-C. Yu and G. Astarita	425	Design of packed towers for selective chemical absorption
A. B. Verver and W. P. M. van Swaaij	435	The gas-solid trickle-flow reactor for the catalytic oxidation of hydrogen sulphide: a trickle-phase model
B. O. Palsson	447	On the dynamics of the irreversible Michaelis-Menten reaction mechanism
S. D. Fields and J. M. Ottino	459	Effect of striation thickness distribution on the course of an unpremixed polymerization
S. D. Fields and J. M. Ottino	467	Effect of stretching path on the course of polymerizations: applications to idealized unpremixed reactors
L. R. Glicksman, W. K. Lord and M. Sakagami	479	Bubble properties in large-particle fluidized beds
H. Honda, T. Mano, M. Taya, K. Shimizu, M. Matsubara and T. Kobayashi	493	A general framework for the assessment of extractive fermentations
K. Shimizu and M. Matsubara	499	A solvent screening criterion for multicomponent extractive fermentation
P. A. Monson	505	On the molecular basis of adsorbed solution behaviour
H.-C. Chang	515	Evolution of nonlinear waves on vertically falling films—a normal form analysis
C. A. Tsiligiannis and G. Lyberatos	535	A linear algebraic approach to steady-state bifurcation of chemical reaction systems
L.-S. Fan, T. S. Ramesh, W.-T. Tang and T.-R. Long	543	Gas-liquid mass transfer in a two-stage draft tube gas-liquid-solid fluidized bed
R. Mann and G. Thomson	555	Deactivation of a supported zeolite catalyst: simulation of diffusion, reaction and coke deposition in a parallel bundle
S. Reyes and K. F. Jensen	565	Percolation concepts in modelling of gas-solid reactions—III. Application to sulphation of calcined limestone
J. Baldyga and S. Rohani	575	Determination of the micromixing level in a CSTR: transient step response of reactive tracers
A. E. Almstedt	581	Distribution of the gas flow in fluidized beds with a slugging behaviour

Number 4

Special issue: Advances in particulate technology

H. A. Barnes, M. F. Edwards and L. V. Woodcock	591	Review Article Number 23. Applications of computer simulations to dense suspension rheology
H. L. Bhat, J. N. Sherwood and T. Shripathi	609	The influence of stress, strain and fracture of crystals on the crystal growth process
A. G. Jones, J. Budz and J. W. Mullin	619	Batch crystallization and solid-liquid separation of potassium sulphate

R. J. Davey and B. Dobbs	631	On the morphology of ceramic powders
R. di Felice, L. G. Gibilaro, S. P. Waldram and P. U. Foscolo	639	Mixing and segregation in binary-solid liquid fluidised beds
B. Waldie, D. Wilkinson and L. Zachra	653	Kinetics and mechanisms of growth in batch and continuous fluidized bed granulation
M. A. Mullier, J. P. K. Seville and M. J. Adams	667	A fracture mechanics approach to the breakage of particle agglomerates
G. H. Kelsall and J. L. Pitt	679	Spherical agglomeration of fine wolframite ((Fe, Mn)WO ₄) mineral particles
O. Molerus	689	Dependence of the drag on particles concentration—a basic model and its practical application
I. M. Al-Khattat and S. T. S. Al-Hassani	707	Towards a computer-aided analysis and design of tablet compaction
B. J. Briscoe	713	Discrete particle-wall interactions in powder flow
T. Rathbone, R. M. Nedderman and J. F. Davidson	725	Aeration, deaeration, and flooding of fine particles
H. G. Polderman, J. Boom, E. de Hilster and A. M. Scott	737	Solids flow velocity profiles in mass flow hoppers
R. K. S. Wong, J. R. F. Arthur and T. Dunstan	745	Induced anisotropy in wet remoulded kaolinite and bentonite model materials
J. J. Benbow and J. Bridgwater	753	The influence of formulation on extrudate structure and strength
A. R. Khan, R. L. Pirie and J. F. Richardson	767	Hydraulic transport of solids in horizontal pipelines—predictive methods for pressure gradients
B. Vincent	779	Phase separation in dispersions of weakly interacting particles
R. J. Akers, A. G. Rushton and J. I. T. Stenhouse	787	Floc breakage: the dynamic response of the particle size distribution in a flocculated suspension to a step change in turbulent energy dissipation
P. F. Luckham and A. Ansarifar	799	Measurement of the interaction forces between polymer coated surfaces
H. Bustamante and P. R. Rutter	809	Flocculation of heterodisperse suspensions of fine coal (–0.5 mm)
B. R. Jennings and K. Parslow	823	Electro-optic detection of colloid flocculation
R. J. Wakeman and E. S. Tarleton	829	Membrane fouling prevention in crossflow microfiltration by the use of electric fields
K. R. Yuregir, M. Ghadiri and R. Clift	843	Impact attrition of sodium chloride crystals
K. E. Puttick and A. S. T. Badrick	855	The mechanical breakdown of sodium chloride crystals
I. M. Hutchings	869	Wear by particulates
N. Harnby, A. E. Hawkins and D. Vandame	879	The use of bulk density determination as a means of typifying the flow characteristics of loosely compacted powders under conditions of variable relative humidity

A. J. Matchett	889	A dynamic model of shear in plane strain in powder systems
R. J. Roberts and R. C. Rowe	903	The compaction of pharmaceutical and other model materials—a pragmatic approach
R. Isherwood, B. R. Jennings and M. Stankiewicz	913	<i>Shorter Communications</i> Electrically induced concentration banding in particulate sols and emulsions
J. J. Benbow and J. Bridgwater	915	Measurement of paste yield by cone penetration
P. D. Taylor, A. J. Matchett and J. Peace	921	A site investigation of cake formation in materials handling equipment

Number 5

Special issue: ISCRE 9 Volume II—Plenary Papers

	vii	Preface
K. F. Jensen	923	Micro-reaction engineering applications of reaction engineering to processing of electronic and photonic materials
H. Tiltscher and H. Hofmann	959	Trends in high pressure chemical reaction engineering
M. J. Crochet	979	Numerical simulation of flow processes
L. F. Razón and R. A. Schmitz	1005	Multiplicities and instabilities in chemically reacting systems—a review
K. Lien, G. Suzuki and A. W. Westerberg	1049	The role of expert systems technology in design
G. F. Froment	1073	The kinetics of complex catalytic reactions
I. Nikov and H. Delmas	1089	Solid-liquid mass transfer in three-phase fixed and fluidized beds
J. Thullie, L. Chiao and R. G. Rinker	1095	Generalized treatment of concentration forcing in fixed-bed plug-flow reactors
G. F. Versteeg, P. M. M. Blauwhoff and W. P. M. Van Swaaij	1103	The effect of diffusivity on gas-liquid mass transfer in stirred vessels. Experiments at atmospheric and elevated pressures
M. A. Hastaoğlu and M. G. Karmann	1121	Modelling of catalytic carbon gasification
L. Boyadzhiev and Z. Lazarova	1131	Study on creeping film pertraction. Recovery of copper from diluted aqueous solutions
T. Stoicos and C. A. Eckert	1137	Solid-liquid equilibria for solvated nonelectrolyte mixtures
G. McKay, S. McKee and H. R. J. Walters	1145	Solid-liquid adsorption based on external mass transfer, macropore and micropore diffusion
L. G. Karlsen and J. Villadsen	1153	Isothermal reaction calorimeters—I. A literature review
L. G. Karlsen and J. Villadsen	1165	Isothermal reaction calorimeters—II. Data treatment
J. Wei, R. Cwiklinski, J. Tomuro and J. Xiao	1175	Temperature differences between phases in a moving bed reactor

P. J. Hamersma and J. Hart	1187	A pressure drop correlation for gas/liquid pipe flow with a small liquid holdup
U. Schafinger	1197	Enhanced centrifugal separation with finite Rossby numbers in cylinders with compartment-walls
A. Gawdzik and M. Berezowski	1207	Multiple steady states in adiabatic tubular reactors with recycle
J. Heck and U. Onken	1211	Hysteresis effects in suspended solid particles in bubble columns with and without draft tube
A. Adin and M. Rebhun	1213	Deep-bed filtration: accumulation-detachment model parameters
A. Gaunand, G. Bouboukas and H. Renon	1221	Iron elimination in cupric chloride hydrometallurgical processes by oxidizing extraction
C. T. Chen and B. L. Crynes	1229	A method for achieving inaccessible conversions by use of cascade CSTR's
A. Datar, B. D. Kulkarni and L. K. Doraiswamy	1233	Effectiveness factors in bidispersed catalysts: the effect of diffusivity variations
R. Hu and T. C. Ho	1239	<i>Shorter Communications</i> Steady-state multiplicity in an incompletely wetted catalyst particle
G. Lyberatos and C. A. Tsiligiannis	1242	A linear algebraic method for analysing Hopf bifurcation of chemical reaction systems
A. K. Kulkarni	1245	Defluidized zone over a horizontally immersed tube in a fluidized bed
X. Delpech de Saint Guilhem and T. A. Ring	1247	Exact solution for the population in a continuous stirred tank crystallizer with agglomeration
V. I. Bykov and A. N. Gorban'	1249	A model of autooscillations in association reactions
P. Schneider	1251	Accuracy of chromatographic moments—effect of peak treatment and approximations
J. S. Vrentas and C.-H. Chu	1256	Effect of variable diffusivity on tubular polymerization reactor performance
Z. Dagan and C. Maldarelli	1259	The influence of surface tension on propagating chemohydrodynamic waves
S. V. Sotirchos	1262	On a class of random pore and grain models for gas-solid reactions
G. Ganser and N. N. Clark	1265	Propagation of continuity and shock waves in an unsupported fluidized bed
S.-M. Yih	1269	<i>Letters to the Editor</i> Comments on solid dissolution with first-order chemical reaction
L.-S. Fan, L. S. Han and R. S. Brodkey	1269	Comments on the buoyancy force on a particle in a fluidized suspension
L. G. Gibilaro, P. U. Foscolo, R. Di Felice and S. P. Waldram	1272	Authors' reply to comments by L.-S. Fan <i>et al.</i>

		<i>Book Reviews</i>
J. M. Smith	1273	Encyclopedia of Fluid Mechanics, Volume 2: Dynamics of Single Fluid Flows and Mixing. Edited by N. P. Cheremisinoff
G. O. Davies	1274	Thermodynamic and Transport Properties of Coal Liquids. By C. Tsonopoulos, J. L. Heidman and S. C. Hwang
M. Streat	1274	Fundamentals and Applications of Ion Exchange. Edited by L. Liberti and J. R. Millar
M. N. Nevin	1275	Modern Chlor-alkali Technology, Vol. 3. Edited by K. Wall
R. Szczepanski	1275	Handbook of Aqueous Electrolyte Solutions—Physical Properties, Estimation and Correlation Methods. By A. L. Horvath
J. R. Flower	1276	The Exergy Method of Thermal Plant Analysis. By T. J. Kotas
K. E. Porter	1276	Distillation Design in Practice—Computer Aided Engineering I. By L. M. Rose
J. Villadsen	1277	Recent Advances in the Engineering Analysis of Chemically Reacting Systems. Edited by L. K. Doraiswamy
H. Eccles	1278	Ion Exchange: Science and Technology. Edited by A. E. Rodrigues
		<i>Announcement</i>
	1279	Distillation and Absorption 1987

Number 6

	i	Danckwerts—Maxwell Prize
R. Seydel and V. Hlavacek	1281	Review Article Number 24. Role of continuation in engineering analysis
T. Yamamoto and T. Ishii	1297	Effect of surface active materials on the drag coefficients and shapes of single large gas bubbles
T. Akiyama and T. Naito	1305	Vibrated beds of powders: a new mathematical formulation
T. Adschiri and T. Furusawa	1313	Estimation of dynamic change in gasification rate of chars—I. A common formulation of dynamic change in experimentally observed surface area during steam gasification of char
T. Adschiri, T. Kojima and T. Furusawa	1319	Estimation of dynamic change in gasification rate of chars—II. Overlapped grain model
I. V. Yentekakis and C. G. Vayenas	1323	Effectiveness factors for reactions between volatile and non-volatile components in partially wetted catalysts
A. Chatterjee and J. M. Tarbell	1333	Matched asymptotic solutions of the coalescence-redispersion model for unmixed feed stream plug flow reactors

R. O. Fox and L. T. Fan	1345	Stochastic modelling of chemical engineering systems. Application of the generalized master equation to the bubble population in a bubbling fluidized bed
V. V. S. Revankar, B. D. Kulkarni and L. K. Doraiswamy	1359	An experimental evaluation of the expanding core model using disproportionation of the potassium benzoate to potassium terephthalate reaction system
D. L. Koch and J. F. Brady	1377	Nonlocal dispersion in porous media: nonmechanical effects
N. Haimour, A. Bidarian and O. C. Sandall	1393	Kinetics of the reaction between carbon dioxide and methyldiethanolamine
D. J. Kaul, R. Sant and E. E. Wolf	1399	Integrated kinetic modelling and transient FTIR studies of CO oxidation on Pt/SiO ₂
C. Özgen and Z. Hiçşasmaz	1413	Pulse testing of an agitated vessel
O. Molerus and W. Latzel	1423	Suspension of solid particles in agitated vessels—I. Archimedes numbers $\lesssim 40$
O. Molerus and W. Latzel	1431	Suspension of solid particles in agitated vessels—II. Archimedes numbers > 40 , reliable prediction of minimum stirrer angular velocities
B. W. Brooks and G. Raman	1439	Effects of different reactor start-up procedures on the continuous-flow emulsion polymerisation of methylmethacrylate
G. Maria and O. Muntean	1451	Model reduction and kinetic parameters identification for the methanol conversion to olefins
J. Y. Day, M. H. Morgan, III and H. Littman	1461	Measurements of spout voidage distributions, particle velocities and particle circulation rates in spouted beds of coarse particles—II. Experimental verification
J. C. Giddings and M. R. Schure	1471	Theoretical analysis of edge effects in field-flow fractionation
C. J. Kim and D. W. Savage	1481	Kinetics of carbon dioxide reaction with diethylaminoethanol in aqueous solutions
P. U. Foscolo and L. G. Gibilaro	1489	Fluid dynamic stability of fluidised suspensions: the particle bed model
J. Arnaldos, M. Lázaro and J. Casal	1501	The effect of magnetic stabilization on the thermal behaviour of fluidized beds
		<i>Shorter Communications</i>
R. M. Chemburkar, O. E. Rössler and A. Varma	1507	Dynamics of consecutive reactions in a CSTR—a case study
D. B. Bukur, N. Nasif and J. G. Daly	1510	On the use of effective bubble diameters in the counter-current backmixing model for fluid bed reactors
T. Z. Fahidy	1513	An application of the Fan-Nassar model to the unsteady-state age distribution of a class of nonideal flow
		<i>Book Reviews</i>
M. B. King	1515	Supercritical Fluid Technology. Edited by J. M. L. Penninger, M. Radoz, M. A. McHugh and V. J. Krukoniš
J. P. O'Connell	1515	Molecular Volumes in Chemistry and Biology: Applications Including Partitioning and Toxicity. By J. C. McGowan and A. Mellors

Number 7

T. Zaleski	1517	Mathematical modelling of cross-flow heat exchangers
H.-S. Law, J. H. Masliyah, R. S. MacTaggart and K. Nandakumar	1527	Gravity separation of bidisperse suspensions: light and heavy particle species
K. R. Westerterp and M. Kuczynski	1539	Gas-solid trickle flow hydrodynamics in a packed column
S. D. Rege and H. S. Fogler	1553	Network model for straining dominated particle entrapment in porous media
P. N. Sharratt and R. Mann	1565	Some observations on the variation of tortuosity with Thiele modulus and pore size distribution
Y. Nakano, S. Iwamoto, I. Yoshinaga and J. W. Evans	1577	The effect of pore necking on Knudsen diffusivity and collision frequency of gas molecules with pore walls
L. M. Sun and F. Meunier	1585	A detailed model for nonisothermal sorption in porous adsorbents
C. K. Lee, M. Morbidelli and A. Varma	1595	Steady state multiplicity behavior of an isothermal axial dispersion fixed-bed reactor with nonuniformly active catalyst
Y. Kawase, B. Halard and M. Moo-Young	1609	Theoretical prediction of volumetric mass transfer coefficients in bubble columns for Newtonian and non-Newtonian fluids
K. Najim, M. U. Le Lann and G. Casamatta	1619	Learning control of a pulsed liquid-liquid extraction column
A. R. Kerstein and B. F. Edwards	1629	Percolation model for simulation of char oxidation and fragmentation time-histories
J. Jorne and T.-J. Cheng	1635	Mass transfer under combined natural and forced convection in a vertical flow channel: assisting and opposing flows
H. C. Kim, P. R. Bishnoi, R. A. Heidemann and S. S. H. Rizvi	1645	Kinetics of methane hydrate decomposition
C. G. Vayenas and S. Pavlou	1655	Optimal catalyst distribution for selectivity maximization in pellets: parallel and consecutive reactions
J. T. Davies	1667	Calculation of critical velocities to maintain solids in suspension in horizontal pipes
J. T. Davies	1671	A physical interpretation of drop sizes in homogenizers and agitated tanks, including the dispersion of viscous oils
A. A. Stravs, J. Wahl, U. von Stockar and P. J. Reilly	1677	Development of an ultrasonic pulse reflection method for measuring relative size distributions of air bubbles in aqueous solutions
R. V. Gholap, D. S. Kolhe, R. V. Chaudhari, G. Emig and H. Hofmann	1689	A new approach for the determination of liquid-solid mass-transfer coefficients in multiphase reactors
E. Müller and H. Hofmann	1695	Dynamic modelling of heterogeneous catalytic reactions —I. Theoretical considerations

E. Müller and H. Hofmann	1705	Dynamic modelling of heterogeneous catalytic reactions—II. Experimental results—oxydehydrogenation of isobutyric aldehyde to methacrolein
R. J. Sadus and C. L. Young	1717	Critical properties of ternary mixtures: hydrocarbon, acetone and alkanenitrile mixtures
D. Basmadjian and P. Coroyannakis	1723	Equilibrium theory revisited. Isothermal fixed-bed sorption of binary systems—I. Solutes obeying the binary Langmuir isotherm
D. Basmadjian, P. Coroyannakis and C. Karayannopoulos	1737	Equilibrium theory revisited. Isothermal fixed-bed sorption of binary systems—II. Non-Langmuir solutes with Type I parent isotherms: azeotropic systems
D. Basmadjian, C. Karayannopoulos and P. Coroyannakis	1753	Equilibrium theory revisited. Isothermal fixed-bed sorption of binary systems—III. Solutes with Type I, II and IV parent isotherms: phase separation phenomena
S. Skogestad and M. Morari	1765	Design of resilient processing plants—IX. Effect of model uncertainty on dynamic resilience
S. S. Öztürk and A. Schumpe	1781	The influence of suspended solids on oxygen transfer to organic liquids in a bubble column
A. Schumpe, A. K. Saxena and L. K. Fang	1787	Gas/liquid mass transfer in a slurry bubble column
J. B. Powell, C.-Y. Jeng and S. H. Langer	1797	Catalytic investigations with the stopped-flow gas chromatographic reactor
H. Yoshida and T. Kataoka	1805	Adsorption of amines and ammonia on H ⁺ -form ion exchanger
H. Oguz, A. Brehm and W.-D. Deckwer	1815	Gas/liquid mass transfer in sparged agitated slurries
J. D. Sherwood	1823	Stability of a plane reaction front in a porous medium
D. L. Brown and C. E. Glatz	1831	Aggregate breakage in protein precipitation
B. K. Cho	1841	Application of nonlinear wave propagation theory to adsorption kinetic measurements on supported catalysts
<i>Shorter Communications</i>		
C. J. Pereira and K. Rajagopalan	1847	General solution for a uniformly impregnated isothermal pellet in a non-uniform environment for a first-order reaction
D. White, Jr. and L. E. Johns	1849	The Frank-Kamenetskii approximation
T. Sridhar	1851	A novel technique for determining kinetics of gas-liquid reactions
L.-S. Fan, R.-H. Jean and K. Kitano	1853	On the operating regimes of cocurrent upward gas-liquid-solid systems with liquid as the continuous phase
W. R. Usry, G. L. Morrison and G. B. Tatterson	1856	On the interrelationship between mass transfer and sound spectra in an aerated, agitated tank
<i>Letters to the Editors</i>		
R. O. Fox and L. T. Fan	1861	Comments on a stochastic approach to the analysis of chemically reacting systems

S. S. Tambe, B. D. Kulkarni and L. K. Doraiswamy	1862	Authors' reply to comments by R. O. Fox and L. T. Fan
J. J. J. Chen	1863	Comments on determination of the lower bound of minimum fluidization velocity: application at elevated temperatures
L. T. Fan, Y. W. Huang and N. Yutani	1864	Authors' reply to comments by J. J. J. Chen
<i>Book Reviews</i>		
C. M. Crowe	1867	Chemical Process Simulation. By A. Husain
D. E. Brown	1867	Process Engineering Aspects of Immobilised Cell Systems. Edited by C. Webb, G. M. Black and B. Atkinson
D. Harrison	1868	Fluidized Bed Combustion. Edited by M. Radovanovic
R. Hughes	1869	Carbon and Coal Gasification—Science and Technology. Edited by J. L. Figueiredo and J. A. Moulijn

Number 8

K. R. Westerterp and M. Kuczynski	1871	A model for a countercurrent gas-solid-solid trickle flow reactor for equilibrium reactions. The methanol synthesis
M. Kuczynski, M. H. Oyeveaar, R. T. Pieters and K. R. Westerterp	1887	Methanol synthesis in a countercurrent gas-solid-solid trickle flow reactor. An experimental study
J. T. Tinge, K. Mencke and A. A. H. Drinkenburg	1899	The absorption of propane and ethene in slurries of activated carbon in water—I
J. R. Thome	1909	Enhanced boiling of mixtures
O. Trnka and M. Hartman	1919	Numerical solution of the model for sulphur dioxide removal in a fluidized bed of sorbent
S. Hartland and S. A. K. Jeelani	1927	Choice of model for predicting the dispersion height in liquid/liquid gravity settlers from batch settling data
F. Kudrewizki and P. Rabe	1939	Hydrodynamics and gas absorption in gassed stirred tanks in presence of tensids
K. A. Akanni, J. W. Evans and I. S. Abramson	1945	Effective transport coefficients in heterogeneous media
A. K. Ray, J. L. Huckaby and T. Shah	1955	Thermal effects of condensation on absorption of gases in growing droplets
A. Brunovská	1969	Dynamic behaviour of a catalyst pellet with nonuniform activity distribution
S. K. Shibata, S. I. Sandler and R. A. Behrens	1977	Phase equilibrium calculations for continuous and semi-continuous mixtures
W. M. Saltzman, S. H. Pasternak and R. Langer	1989	Quantitative image analysis for developing microstructural descriptions of heterogeneous materials
M. Kümmel and H. W. Andersen	2005	Controller adjustment for improved nominal performance and robustness—I. A frequency domain approach

M. Kümmel and H. W. Andersen	2011	Controller adjustment for improved nominal performance and robustness—II. Robust geometric control of a distillation column
N. Brauner, D. Moalem Maron and W. Zijl	2025	Interfacial collocation equations of thin liquid film: stability analysis
M. M. Hassan, N. S. Raghavan and D. M. Ruthven	2037	Pressure swing air separation on a carbon molecular sieve—II. Investigation of a modified cycle with pressure equalization and no purge
R. G. Rice and M. A. Littlefield	2045	Dispersion coefficients for ideal bubbly flow in truly vertical bubble columns
<i>Shorter Communications</i>		
C. A. Grattoni, M. R. Rosen, R. Chertcoff and M. S. Bidner	2055	Use of radioisotopes to measure concentration distributions inside porous media during displacement tests
B. J. Azzopardi	2059	Observations of drop motion in horizontal annular flow
<i>Letters to the Editors</i>		
G. B. Wallis	2063	Comments on generalized friction factor and drag coefficient correlations for fluid-particle interactions
L. G. Gibilaro	2063	Author's reply to comments by Graham B. Wallis
	2065	Erratum
<i>Announcement</i>		
	2067	ISCRE 10. Call for papers

Number 9

K. J. Liekhus and T. R. Hanley	2069	A shrinking-aggregate two-environment mixing model
A. K. Sen	2075	Mass transfer with chemical reaction—I. A second-order irreversible reaction
M. R. Prairie and J. E. Bailey	2085	Experimental and modelling investigations of steady-state and dynamic characteristics of ethylene hydrogenation on Pt/Al ₂ O ₃
M. Sheintuch	2103	The determination of global solutions from local ones in catalytic systems showing steady-state multiplicity
A. Kretsovalis and R. S. H. Mah	2115	Effect of redundancy on estimation accuracy in process data reconciliation
W.-T. Tang, K. Wisecarver and L.-S. Fan	2123	Dynamics of a draft tube gas-liquid-solid fluidized bed bioreactor for phenol degradation
M. Jaroniec, R. Madey and D. Rothstein	2135	Correlation of heterogeneity parameters for adsorption of single gases and gas mixtures on solids
A. Derylo-Marczewska, M. Jaroniec, J. Ościk, A. W. Marczewski and R. Kusak	2143	Discussion of the theoretical isotherms describing adsorption from multicomponent liquid mixtures on heterogeneous solids of quasi-Gaussian energy distribution
J. J. Benbow, E. W. Oxley and J. Bridgwater	2151	The extrusion mechanics of pastes—the influence of paste formulation on extrusion parameters
D. J. Gunn, M. M. Ahmad and M. N. Sabri	2163	Radial heat transfer to fixed beds of particles

P. R. Krishnaswamy, B. E. Mary Chan and G. P. Rangaiah	2173	Closed-loop tuning of process control systems
J. R. Bourne, F. Brogli, F. Hoch and W. Regenass	2183	Heat transfer from exothermically reacting fluid in vertical unstirred vessels—I. Temperature and flow fields
J. R. Bourne, F. Brogli, F. Hoch and W. Regenass	2193	Heat transfer from exothermically reacting fluid in vertical unstirred vessels—II. Free-convection heat transfer correlations and reactor safety
M. S. Spencer	2197	Simulation of adiabatic conditions in experimental catalytic reactors
P. G. Debenedetti	2203	Clustering in dilute, binary supercritical mixtures: a fluctuation analysis
A. Kopner, A. Hamm, J. Ellert, R. Feist and G. M. Schneider	2213	Determination of binary diffusion coefficients in supercritical chlorotrifluoromethane and sulphurhexafluoride with supercritical fluid chromatography (SFC)
		<i>Shorter Communication</i>
D. B. Bukur and N. Nasif	2219	The countercurrent backmixing model for fluid bed reactors—effect of cross flow and boundary conditions
		<i>Book Reviews</i>
A. Williams	2223	Combustion Theory, Second Edition. By F. A. Williams
P. N. Rowe	2223	Gas Fluidisation Technology. Edited by D. Geldart
R. E. Bahu	2224	Moisture Sensors in Process Control. By K. Carr-Brion
J. A. Howell	2224	Fluid Mixture Separation Technologies for Cost Reduction and Process Improvement. By J. L. Bravo, J. R. Fair, J. L. Humphrey, C. L. Martin, A. F. Seibert and S. Joshi
	2227	Erratum

Number 10

M. Feinberg	2229	Review Article Number 25. Chemical reaction network structure and the stability of complex isothermal reactors—I. The Deficiency Zero and Deficiency One Theorems
D. D. Do and R. G. Rice	2269	On the relative importance of pore and surface diffusion in non-equilibrium adsorption rate processes
A. P. Dhupe, V. K. Jayaraman, A. N. Gokarn and L. K. Doraiswamy	2285	An experimental study of the effect of inerts on gas-solid reactions
A. Leitão, C. Costa and A. Rodrigues	2291	Studies on the impregnation step of the Merox process
K. J. Myers, M. P. Duduković and P. A. Ramachandran	2301	Modelling churn-turbulent bubble columns—I. Liquid-phase mixing
T. J. Stanley and J. A. Quinn	2313	Phase-transfer catalysis in a membrane reactor
R. A. Alberty	2325	Thermodynamics of the catalytic polymerization of alkenes in the gas phase

D. Herskowits, V. Herskowits and A. Tamir	2331	Desorption of acetone in a two-impinging-stream spray desorber
V. Augugliaro and L. Rizzuti	2339	Kinetics of carbon dioxide absorption into catalysed potassium carbonate solutions
R. P. Smet and R. E. Johnson	2345	On the effective viscosity of a suspension of drops partially coated by a stagnant film
J. Gilron and D. Hasson	2351	Calcium sulphate fouling of reverse osmosis membranes: flux decline mechanism
J. S. Dennis and A. N. Hayhurst	2361	The effect of CO ₂ on the kinetics and extent of calcination of limestone and dolomite particles in fluidised beds
L. B. Brakalov	2373	A connection between the orthokinetic coagulation capture efficiency of aggregates and their maximum size
M. Tjahjadi, S. K. Gupta, M. Morbidelli and A. Varma	2385	Parametric sensitivity in tubular polymerization reactors
S.-H. Hwang and H.-C. Chang	2395	A theoretical examination of closed-loop properties and tuning methods of single-loop PI controllers
M. A. Hastaoğlu	2417	Numerical solution of three-dimensional moving boundary problems: melting and solidification with blanketing of a third layer
M. Morari, E. Zafiriou and B. R. Holt	2425	Design of resilient processing plants. New characterization of the effect of RHP zeros
M. Laso, L. Steiner and S. Hartland	2429	Dynamic simulation of liquid-liquid agitated dispersions—I. Derivation of a simplified model
M. Laso, L. Steiner and S. Hartland	2437	Dynamic simulation of agitated liquid-liquid dispersions—II. Experimental determination of breakage and coalescence rates in a stirred tank
S. J. Parulekar, D. Ramkrishna, N. R. Amundson and R. W. Flumerfelt	2447	Interfacial surfactant concentrations on an oscillating droplet: solution of a singular boundary-initial value problem
M. A. Isla and J. Cerdá	2455	Simultaneous synthesis of distillation trains and heat exchanger networks
B. P. Yeo	2465	<i>Shorter Communications</i> Optimal singular control of a continuous stirred-tank reactor via quasi-linearization
I. Ortiz, D. de Campos and J. A. Irabien	2467	Analysis and modelling of 1-butyl alcohol esterification with hydrobromic acid and sulfuric acid as homogeneous catalyst
E. D. Negri, O. M. Alfano and M. G. Chiovetta	2472	Direct reduction of hematite in a moving bed. Comparison between one- and three-interface pellet models
M. Szatkowski	2475	Some comments on flotation kinetics
R. N. Occhiogrosso and M. A. McHugh	2478	Critical-mixture oxidation of cumene
P. K. Agarwal	2481	The residence phase of active particles in fluidized beds of smaller inert particles
C. S. Lee, J. J. Ou and S. H. Chen	2484	Quantification of mixing from the Eulerian perspective: flow through a curved tube

V. Linek and V. Vacek	2487	<i>Letters to the Editors</i> Comments on the measurement of oxygen diffusion coefficients in polymeric solutions
J. J. J. Chen	2488	Comments on improvements on a replacement for the logarithmic mean
W. R. Paterson	2490	Author's reply to comments by J. J. J. Chen
S. T. Kolaczkowski	2493	<i>Book Reviews</i> Elements of Chemical Reaction Engineering. By H. S. Fogler
J. R. A. Pearson	2493	First-order Partial Differential Equations: Vol. 1. By Rhee, Aris and Amundson
S. J. Becker	2494	Handbook of Heat and Mass Transfer, Vol. 2: Mass Transfer and Reactor Design. Edited by N. P. Cheremisinoff
	2495	Announcement

Number 11

	iii	Second P. V. Danckwerts Memorial Lecture
M. M. Sharma	2497	The Second P. V. Danckwerts Memorial Lecture presented at Brighton, U.K., 7 September 1987: Chemical engineering science in India—needs, opportunities and challenges
A. Pandit and M. M. Sharma	2517	Intensification of heterogeneous reactions through hydro-tropy: alkaline hydrolysis of esters and oximation of cyclododecanone
M. Cable and J. R. Frade	2525	Diffusion-controlled mass transfer to or from spheres with concentration-dependent diffusivity
C. Bindschaedler and N. A. Peppas	2531	Detachment of small axisymmetric particles from fluid-liquid interfaces
C. B. Ching, C. Ho, K. Hidajat and D. M. Ruthven	2547	Experimental study of a simulated counter-current adsorption system—V. Comparison of resin and zeolite absorbents for fructose-glucose separation at high concentration
W. B. U. Tanzil and W. V. Pinczewski	2557	Blast furnace hearth drainage: physical mechanisms
K. Schnitzlein and H. Hofmann	2569	An alternative model for catalytic fixed bed reactors
G. M. Ostrovsky, A. G. Zyskin, Yu. S. Snagovsky and M. G. Slinko	2579	Steady state multiplicity of chemically reacting systems. The method of computation
R. L. Michalowski	2587	Flow of granular media through a plane parallel/converging bunker
J. Baldyga and S. Rohani	2597	Micromixing described in terms of inertial-convective disintegration of large eddies and viscous-convective interactions among small eddies—I. General development and batch systems

S. Rohani and J. Baldyga	2611	Micromixing described in terms of inertial-convective disintegration of large eddies and viscous-convective interactions among small eddies—II. Semi-batch and continuous stirred tank reactors
R. M. Chemburkar, M. Morbidelli and A. Varma	2621	Optimal catalyst activity profiles in pellets—VII. The case of arbitrary reaction kinetics with finite external heat and mass transport resistances
C. G. Vayenas and S. Pavlou	2633	Optimal catalyst activity distribution and generalized effectiveness factors in pellets: single reactions with arbitrary kinetics
P. Englezos, N. Kalogerakis, P. D. Dholabhai and P. R. Bishnoi	2647	Kinetics of formation of methane and ethane gas hydrates
P. Englezos, N. Kalogerakis, P. D. Dholabhai and P. R. Bishnoi	2659	Kinetics of gas hydrate formation from mixtures of methane and ethane
O. Shoham, J. P. Brill and Y. Taitel	2667	Two-phase flow splitting in a tee junction—experiment and modelling
Y. C. Chiew and E. D. Glandt	2677	Effective conductivity of dispersions: the effect of resistance at the particle surfaces
T. R. Blake and M. R. Webber	2687	A theoretical representation of single bubble motion in a cylindrical gas fluidized bed
S. Sieniutycz	2697	From a least action principle to mass action law and extended affinity
R. Paludetto, G. Gamba, G. Storti, S. Carrà and M. Morbidelli	2713	Multicomponent adsorption equilibria of highly non-ideal mixtures: the case of chloroaromatic mixtures on zeolite
B. M. Liang, R. W. Hartel and K. A. Berglund	2723	Contact nucleation in sucrose crystallization
S. Vigneswaran and C. Tien	2729	Transient behavior of deep-bed filtration of Brownian particles
S. P. Waldram	2741	Some general observations on the recycle flow model
R. M. Marutovsky and M. Bülow	2745	Determination of the matrix of kinetic coefficients for the internal mass transport of two-component mixtures in porous solids
W. F. Ramirez	2749	Optimal state and parameter identification. An application to batch fermentation
K. J. Myers, M. P. Duduković and P. A. Ramachandran	2757	Modeling liquid-phase chemical reaction and interphase mass transfer in churn-turbulent bubble columns
J. B. Rawlings and W. H. Ray	2767	Stability of continuous emulsion polymerization reactors: a detailed model analysis
E. Tronconi and P. Forzatti	2779	<i>Shorter Communications</i> Diffusion-limited temperature programmed desorption from heterogeneous catalytic surfaces
K. Georgakopoulos and R. Broucek	2782	Investigation of the non-ideality of an internal recycle reactor using a concentration controlled test reaction
J. J. Perona and C. H. Byers	2785	Electrostatic forces on conducting fluid spheroids in a parallel field

A. Ohkawa, D. Kusabiraki, Y. Kawai and N. Sakai	2788	Flow characteristics of an air-entrainment type aerator having a long downcomer
T. Akiyama and K. Atsumi	2790	Mathematical formulation of cake filtration for deformable solid and uniqueness of a similarity solution
F. Potůček and J. Stejskal	2793	Oxygen diffusivity in Ellis liquids
P. N. Rowe	2795	A convenient empirical equation for estimation of the Richardson-Zaki exponent
R. A. Heidemann	2797	<i>Letters to the Editors</i> Comments on on the uniqueness in equilibrium calculations
T. Westerlund and H. Saxén	2798	Authors' reply to comments by R. A. Heidemann
M. W. Biddulph	2801	<i>Book Reviews</i> Distillation for University Students. By I. A. Furzer
J. D. Green	2801	Process Analyzer Technology. By K. J. Clevett
F. Goodridge	2802	Principles of Electrochemical Engineering: Extended Version of a DECHEMA Experimental Course. By E. Heitz and G. Kreysa
M. R. Smith	2802	Solid-Liquid Separation Processes and Technology. By L. Svarovsky
K. R. Gray	2803	Advanced Gasification—Solar Energy R & D in the European Community, Series E, Vol. 8. Edited by A. A. C. M. Beenackers and W. van Sway
I. P. T. Moore	2804	Advances in Transport Processes: Volume IV. Edited by A. S. Mujumdar and R. A. Mashelkar
B. Jones	2804	Gas Turbine Fuels and Their Influence on Combustion. By J. Odgers and D. Kretschmer
N. Macleod	2805	Heat Transfer in Medicine and Biology: Analysis and Applications. Edited by A. Shitzer and R. C. Eberhart
A. N. Emery, C. F. Forster, L. Kricka, A. Lyddiatt, D. A. Smith and C. M. Thomas	2806	Comprehensive Biotechnology: The Principles, Applications and Regulations of Biotechnology, in Industry, Agriculture and Medicine. Editor-in-Chief M. Moo-Young
	2809	Errata
Number 12		
M. Popović and C. W. Robinson	2811	The specific interfacial area in external-circulation-loop airlifts and a bubble column—I. Aqueous sodium sulphite solution
M. Popović and C. W. Robinson	2825	The specific interfacial area in external-circulation-loop airlifts and a bubble column—II. Carboxymethyl cellulose/sulphite solution
P. Murray and G. F. Carey	2833	Finite element analysis of mass transport through a viscous fluid with reaction
J. A. Trangenstein	2847	Customized minimization techniques for phase equilibrium computations in reservoir simulation
J. Zhao, C. J. Lim and J. R. Grace	2865	Flow regimes and combustion behaviour in coal-burning spouted and spout-fluid beds

R. Wojsz and M. Rozwadowski	2877	An attempt to determine the function defining capillary structure of microporous adsorbents
Je. Alvarez and Jo. Alvarez	2883	Solution of summation-difference equations by collocation techniques
L. M. Sun and F. Meunier	2899	Non-isothermal adsorption in a bidisperse adsorbent pellet
D. V. Khakhar, J. G. Franjone and J. M. Ottino	2909	A case study of chaotic mixing in deterministic flows: the partitioned-pipe mixer
R. Seydel and V. Hlavacek	2927	Strategy of calculation of periodic solutions
J. O. Valderrama, S. Obaid-Ur-Rehman and L. A. Cisternas	2935	Application of a new cubic equation of state to hydrogen sulfide mixtures
G. V. Eroshenkova, S. A. Volkov and M. G. Slinko	2941	Catalytic decomposition reactions performed in the chromatographic moving-bed reactor
A. Barresi and G. Baldi	2949	Solid dispersion in an agitated vessel
		<i>Shorter Communications</i>
J. O. Valderrama and L. A. Cisternas	2957	On the choice of a third (and fourth) generalizing parameter for equations of state
P. S. Fedkiw and J. Newman	2962	Friction factors for creeping flow in sinusoidal periodically constricted tubes
S. Kaguei, M. Nishio and N. Wakao	2964	Parameter estimation from constant-pattern thermal waves in an adsorption column
D. B. Bukur and J. G. Daly	2967	Gas hold-up in bubble columns of Fischer-Tropsch synthesis
A. Barresi and G. Baldi	2969	Solid dispersion in an agitated vessel: effect of particle shape and density
S. K. Bhatia	2972	On the apparently quasi-steady catalytic surface
G. G. Chase and M. S. Willis	2974	Dependence of the symmetry of the volume-averaged partial stress tensor on the symmetry at the microscopic level
L. Rizzuti, V. Augugliaro and G. Marrucci	2976	On ozone absorption in alkaline solutions in packed trickle bed
N. Epstein and P. P. Chandnani	2977	Gas spouting characteristics of fine particles
		<i>Letters to the Editors</i>
J. Kopeć	2983	Comments on modelling and simulation of a continuous fluidized-bed dryer
F. S. Lai, Yiming Chen and L. T. Fan	2985	Authors' reply to comments by J. Kopeć
H. Nasr-El-Din	2986	Comments on scaling-up rules for solids suspension in stirred vessels
C. Buurman	2987	Author's reply to comments by H. Nasr-El-Din
		<i>Book Review</i>
T. Peirce	2989	Advanced Combustion Methods. Edited by F. J. Weinberg
	i	Index to Vol. 42, 1987

